

45. In axial flow machinery within a fluid flow defining duct and having a first multi-bladed rotor positioned between a first and second stator having an equal number of stationary vanes, a second multi-bladed rotor having a different number of blades from the first rotor and positioned between the second stator and a third stator having an equal number of vanes with the first and second stators so that the first rotor blades coact with the vanes of the first and second stator to produce first and second noise creating spinning modes of a fundamental noise frequency equal to the speed of the first rotor times the number of blades in the first rotor and so that the blades of the second rotor interact with the vanes of the second and third stator to form third and fourth noise creating spinning modes having a different number of lobes than the first and second noise creating spinning modes and having a fundamental noise frequency equal to the speed of the second rotor times the number of blades in the second rotor, the method of cancelling said noise creating spinning modes comprising indexing the first stator with respect to the second stator to cancel said first and second noise creating spinning modes, and indexing the third stator with respect to the second stator to cancel said third and fourth noise creating spinning modes.

46. An axial flow spaced machinery within a fluid flow defining duct and comprising first, second, and third stators having an equal number of stationary vanes, a first rotor positioned between said first and second stators, a second rotor positioned between said second and third stators, said first rotor and said second rotor having a different number of blades on the periphery thereof, means to cause said first rotor to rotate with respect to said first and second stators so that the blades of said first rotor interact with the vanes of said first and second stators to establish first and second noise creating spinning modes, means to cause said second rotor to rotate with respect to the vanes of said second and third stators so that the blades of said second rotor interact with the vanes of said second and third stators to produce third and fourth noise creating spinning modes, means to index said first stator with respect to said second stator to cancel said first and second noise creating spinning modes, means to index said third stator with respect to said second stator to cancel said third and fourth noise creating spinning modes.

47. In an axial flow compressor having a fluid flow confining case with an open inlet end, a rotor of selected blade number located within said case, two stators of selected vane number located within said case on opposite sides of said rotor, and means to position said stators with respect to each other and to said rotor so as to reduce the intensity of the noise creating spinning modes

created by the rotation of said rotor between said stators and thereby reduce the noise intensity external of and beneath said case wherein said noise reduction is caused by selecting said vane numbers and said blade numbers so that the velocity of said spinning mode is below cutoff and wherein the number of said vanes in each of said stators is greater than twice the number of said blades multiplied by the harmonic index of the noise source being reduced.

48. In an axial flow compressor having a fluid flow confining case with an open inlet and, a rotor of selected blade number located within said case, two stators of selected vane number located within said case on opposite sides of said rotor, and means to position said stators with respect to each other and to said rotor so as to reduce the intensity of the noise creating spinning modes created by the rotation of said rotor between said stators and thereby reduce the noise intensity external of and beneath said case wherein said noise reduction is caused by selecting said vane numbers and said blade numbers so that the velocity of said spinning mode is below cutoff and wherein the number of said vanes in each of said stators and the number of said blades produce spinning modes in a wave pattern having at least eight lobes.

References Cited by the Examiner

UNITED STATES PATENTS

1,502,903	7/24	Campbell	253—39
1,525,814	2/25	Lasche	253—39
1,585,218	5/26	Watanabe.	
1,688,809	10/28	Gill	103—89 X
1,788,307	1/31	Lack	253—148
1,868,008	7/32	Gardner.	
2,191,341	2/40	Curley	230—120
2,870,956	1/59	Dhonan et al.	230—114
2,893,508	7/59	Baruch et al.	230—232 X
2,976,011	3/61	Stalker	230—122 X
3,006,602	10/61	Caruso et al.	253—39
3,035,759	5/62	Paulson et al.	230—122
3,096,073	7/63	Homola et al.	253—78 X

FOREIGN PATENTS

139,785	10/20	Great Britain.
226,203	7/25	Great Britain.
300,002	11/28	Great Britain.
348,032	5/31	Great Britain.
668,434	3/52	Great Britain.

KARL J. ALBRECHT, *Primary Examiner.*

JOSEPH H. BRANSON, JR., *Examiner.*